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EXAMINER	
KITOV, ZEEV	

ART UNIT	PAPER NUMBER
2836	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/616,105	KEMPINSKI, STEVE JOHN	
	Examiner	Art Unit	
	Zeev Kitov	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02/14/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Objection

Claim 42 is objected to due to a following typing error. The 1st line should be retyped as follows: "wherein said metal can is"....

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "a discharge circuit being at least partially contained within said housing" (of a charging circuit) in Claim 18 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Objection

Specification is objected to since it failed to adequately support the Claim 18 of the claimed invention. A following limitation of Claim 18 is not supported by the Specification: "a discharge circuit being at least partially contained within said housing" (of a charge circuit). Drawings do not illustrate this limitation; the Specification is silent on this matter. Therefore, it is not clear what part of the igniter 14 shown in Fig.1 can be located in the housing common with the charging circuit 12 separated from the igniter by the cable 16. According to 37 CFR 1.71(a), "The specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5, 8 - 10, 13, 27, 31, 36 are rejected under 35 U.S.C. 102(b) as being anticipated by McNulty (US 2,716,720), further called McNulty 720. McNulty 720 discloses all the elements of Claim1 including a low-energy charging circuit (element 20 in Fig.1) having an input and an output, the charging circuit being operable to utilize operating power received on the input (from the battery, element 54 in Fig. 1) to supply a high voltage, low current charging signal on the output; a high-energy discharge circuit (elements 77, 77a, 75, 75a in Fig. 1) including an input, an igniter (elements 22, 22a in Fig. 1) and a number of electrical components, the discharge circuit input being connected to the charging circuit output to receive the charging signal (through wiring 87, 69, 70 in Fig. 1), wherein the electrical components include an energy storage device (capacitors 78, 78a in Fig. 1) for storing electrical energy received from the charging signal and a switching device (elements 75, 75a in Fig. 1) for supplying the stored energy to the igniter; and a low-energy electrical cable (elements 87, 69, 70, 24 in Fig. 1), connecting the charging circuit output with the discharge circuit input.

Regarding Claim 2, McNulty 720 discloses the charging and discharge circuits

remotely located from each other (shown in Fig. 8) on an aircraft inherently having a fuselage, wings, and at least one engine, with the discharge circuit being located at the engine (col. 3, lines 64 – 70).

Regarding Claim 4, McNulty 720 discloses protective devices shielding the low-energy charging circuit together with other electrical circuitry (col. 3, line74 – col. 4, line10).

Regarding Claim 5, McNulty 720 discloses a fly-back transformer (elements 77, 77a in Fig. 1).

Regarding Claim 8, McNulty 720 discloses the energy storage device as a capacitor (elements 78, 78a in Fig. 1).

Regarding Claim 9, McNulty 720 discloses the switching device as a spark gap (elements 75, 75a in Fig. 1).

Regarding Claim 10, McNulty 720 discloses the high-energy discharge circuit including a pulse stretching inductor (secondary windings of transformers 81, 81a in Fig. 1).

Regarding Claims 13 and 36, McNulty 720 discloses all of the electrical components within the discharge circuit (elements 73, 73a, 77, 77a, 78, 78a and 83, 83a in Fig. 1) are passive components.

Regarding Claim 27, McNulty 720 discloses a first housing (element 26 in Fig. 1 and 8), a charging circuit located within the first housing and having one or more active components (relays 48 and 66 and cam, elements 31, 32 with its contacts 34, 34 in Fig. 1) and an output (wires 69, 70, 87 in Fig.1) for supplying a charging signal from the

housing. The relays and cam mechanism are inherently active components by definition, since the active component is the one having ability of amplifying the signal. If further discloses a second housing (element 27, 27a in Fig. 1 and 8); a discharge circuit being at least partially contained within the second housing and including: an input (lines 88, 69 in Fig. 1) for receiving the charging signal, an energy storage device (elements 78, 78a in Fig. 1) contained within the second housing for storing electrical energy received from the charging signal, a switching device (element 75, 75a in Fig. 1) for supplying the stored energy, and an igniter (element 22,22a in Fig. 1), an electrical cable (lines 24, 25, 87, 70,69, 69, 88 in Fig. 1) connected between the first and second housings to transmit the charging signal from the charging circuit to the discharge circuit; wherein the first housing provides shielding of the one or more active components (col. 3, line74 – col. 4, line10) and the second housing is located near the igniter (element 22 in Fig. 1,6), whereby the exciter system is partitioned between the first and second housings (elements 26 and 27, 27a in Fig. 1 and 8).

Regarding Claim 31, McNulty 720 discloses one or more protective devices shielding the charging circuit together with other electrical circuitry (col. 3, line74 – col. 4, line10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Mathisen (US 2,566,235). As was stated above, McNulty 720 discloses all the elements of Claims 1 and 2. However, regarding Claims 3 and 30, it does not disclose the charging circuit being located within the aircraft fuselage and the low-energy cable extending from the aircraft fuselage into the aircraft wings.

McNaulty720 teaches the ignition system as being split into two separate units, charger (element 26 in Fig. 1) and discharger (elements 27, 27A in Fig. 1). It further teaches the discharger being positioned as close as possible to the engine (col. 3, lines 64 – 70). Therefore, for the aircraft having the engines in the wings, the discharger is positioned in the wings.

However, it does not disclose positioning the charger positioned in the fuselage.

Mathisen discloses the ignition system including the manual control switch (element 195 in Fig.2) located in the pilot cabin (in fuselage) and the engines located in the wings (col. 3, lines 59 – 67). Therefore, it is inevitable to have cables extending from the fuselage to the wings to control the ignition. The McNaulty720 charger includes the cam but modern charger circuits are built with electronics containing active parts. Both references have the same problem solving area, namely providing means of ignition for aircrafts. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNaulty720 solution by placing the charger in the fuselage rather than in the wings, because (I) it would provide the charger parts much better environment (better temperature range, lesser vibrations, moderate

humidity), which in turn would substantially improve the equipment reliability, and (II) it would make easier control (shutting off) ignition in a case of a fire emergency.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Standard Handbook for Electrical Engineers and the Court Decision *In re Boesch*. As was stated above, McNulty 720 discloses all the elements of Claim 1. However, regarding Claims 6 and 7, it does not disclose the current supplied by the charging unit being less or equal to 100 milliamps. The Standard Handbook for Electrical Engineers discloses that the cost of power transmission is directly proportional to the carried current (formula 13 – 1 on page 14 - 3). Therefore, as well known in the art of Electrical Engineering to reduce the cost of power transmission, the voltage is stepped up and the current eventually is reduced. This is true for the power transmission lines and for the cables as well. As to particular value of transmitted current, from formula 13 – 1, it is clear that the current value affects the cost of transmission and therefore, the current value is the result effective variable. The Court Decision states that discovering an optimum value of the result effective variable involves only routine skill in the art. On one side, it is desirable to reduce the current value as much as possible, since it reduces the cost of cabling. On other side, stepping up the voltage beyond some level may be costly as well. Therefore, the designer should select an optimum value of the current (voltage). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by stepping up the voltage and reducing the current to be

transmitted by the charging circuit, since it has been held that discovering an optimum value of the result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of McNulty (US 2,896,123), further called McNulty 123. As was stated above, McNulty 720 discloses all the elements of Claim 1. However, regarding Claim 11, it does not disclose a resistor. McNulty 123 discloses the resistor (element 12 in Fig. 1) providing a ground reference for a portion of the circuit. Both references have the same problem solving area, namely providing ignition means for aircraft engine. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by a way of analogy adding the resistor to the discharge circuit of McNulty 720, because as McNulty 123 states (col. 4, lines 53 – 59), the resistor is provided to discharge the capacitor during the time that the contact is open, i.e. at the time of pause between pulses charging the capacitor.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of McMills (US 4,583,811). As was stated above, McNulty 720 discloses all the elements of Claim 1. However, regarding Claim 12, it does not disclose a coaxial cable. McMills discloses a coaxial cable (element 16 in Fig.1, col.5, lines 41 – 44) used in aircraft wiring system. Both references have the same problem solving area, namely

providing means for aircraft cable wiring. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by adding the coaxial cable according to McMills, because as McMills states (col. 1, lines 12 –17), it provides an EMI protection for aircraft electronics.

Claims 14, 32, 37 - 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Straub (US 4,978,309). Regarding Claims 14 32 and 41, McNulty 720 discloses a housing (elements 27 and 27a in Fig. 8) connected to the low-energy electrical cable (elements 25, 25a in Fig. 8), wherein the electrical components of the discharge circuit are located within the housing (see elements 27, 27a in Fig. 1). However, it does not disclose a connector. Straub discloses the cable connector (element 10 in Fig. 2). Both references have the same problem solving area, namely providing means for ignition of the aircraft engine. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by adding the cable connector according to Straub, because use of the cable connector will make a connection easily removable if maintenance, test or repair of the ignition system is necessary.

Regarding Claim 37, McNulty 720 discloses a housing including a metal can (elements 26 and 27, 27a inFig.8) and a metal lid (element 141 in Fig. 8), the can inherently having a bottom wall, at least one side wall integral with the bottom wall, and an open end (a separable cover 141 is an evidence for that); the lid covering the open end is being electrically connected to the can (the can is a metal item); first and second

openings in the housing (for cables); a discharge circuit located within the housing (the circuits within the boundaries of elements 27, 27a in Fig. 8), the discharge circuit having an input for receiving operating power via the first opening (through cable 25, 25a) and an output (wire 84, 84a in Fig. 8) for providing an ignition pulse via the second opening. As to a connector, Straub discloses the cable connector (element 10 in Fig. 2). Both references have the same problem solving area, namely providing means for ignition of the aircraft engine. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by adding the cable connector according to Straub connected to the output of the discharge circuit, because use of the cable connector will make a connection easily removable if maintenance, test or repair of the ignition system is necessary.

Regarding Claim 38, McNulty 720 discloses the discharge circuit including a ground connection (wire 24 in Fig. 1) electrically shorted to the metal can and the metal lid. The cans are grounded (col. 3, line 74 – col. 4,line 2), thus making a whole structure of the metal can including the lid being grounded.

Regarding Claims 39 and 40, McNulty 720 discloses the discharge circuit including an energy storage device (element 78, 78a in Fig.1) and a switching device (element 75, 75a in Fig. 1) and other passive components sealed within the can (col. 11, lines 30 – 57). By definition, the passive components are the components lacking amplification.

Claims 28, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Straub, Minks, Standard Handbook for Electrical Engineers and the Court Decision *In re Boesch*. As was stated above, McNulty 720 discloses all the elements of Claim 27. However, regarding Claims 28 and 29, it does not disclose the current supplied by the charging unit being less or equal to 100 milliamps. The Standard Handbook for Electrical Engineers discloses that the cost of power transmission is directly proportional to the carried current (formula 13 – 1 on page 14 - 3). Therefore, as well known in the art of Electrical Engineering to reduce the cost of power transmission, the voltage is stepped up and the current eventually is reduced. This is true for the power transmission lines and for the cables as well. As to particular value of transmitted current, from formula 13 – 1, it is clear that the current value affects the cost of means of transmission and therefore, the current value is the result effective variable. The Court Decision states that discovering an optimum value of the result effective variable involves only routine skill in the art. On one side, it is desirable to reduce the current value as much as possible, since it reduces the cost of cabling. On other side, stepping up the voltage beyond some level may be costly as well. Therefore, the designer should select an optimum value of the current (voltage). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by stepping up the voltage and reducing the current to be transmitted by the charging circuit, since it has been held that discovering an optimum value of the result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 15, 16, 17, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Straub and Minks (US 3,395,684). As was stated above, McNulty 720 and Straub disclose all the elements of Claims 1 and 14. However, regarding Claims 15 and 16, they do not disclose the electrical components being sealed and potted within the housing. Minks discloses the electrical components (shown in Fig. 5) sealed within the igniter housing (see Claim 1). Regarding Claim 16, it further discloses the electrical components (shown Fig. 5) being potted within the igniter housing (Fig. 4, col. 6, lines 32 - 44). Both references have the same problem solving area, namely providing means for ignition of the engine. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified solution of McNulty 720 by potting the electrical parts of the ignition unit according to Minks, because as Minks states (col. 1, lines 49 – 55), it helps to protect the ignition circuit against adverse environmental influences, such as temperature and vibration.

Regarding Claim 17, McNulty 720 discloses the exciter unit including its output lead carrying sparking charge (element 84 in Fig. 1) being positioned at or adjacent the engine (as close as possible to the spark gaps of the igniter plugs (col. 3, lines 64 – 70). In the McNulty 720 system modified according to Straub, i.e. having the connectors, the output connector is directly attached to the igniter. A motivation of modification of the primary reference is the same as above.

Regarding Claim 33, Minks discloses sealing the whole exciter system including the energy storage (element 32 in Fig. 4) and switching device (element 47 in Fig. 4) being sealed (see Claim 1). A motivation for modification of the primary reference is the same as above.

Regarding Claim 35, Minks discloses all elements including energy storage device (element 32 in Fig. 4) being potted within the can (Fig. 4, col. 6, lines 32 - 44). A motivation for modification of the primary reference is the same as above.

Claims 18, 22 - 26, 34, 42, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Straub and Minks. Regarding Claim 18, McNulty 720 discloses following elements: a charging circuit (element 20 in Fig. 1) having an output and supplying a charging signal on the output; a housing (element 26 in Fig.8) having first and second openings (elements 90, 92, 52 and 24 in Fig. 8); a discharge circuit including an input (input for cables 25, 25a in Fig. 8) for receiving the charging signal, an energy storage device (elements 78,78a in Fig.1) contained within the housing for storing electrical energy received from the charging signal, a switching device (elements 83, 83a in Fig. 1) connected to the output, and an igniter (elements 22, 22a in Fig.1) directly attached to the output. However, it does not disclose the electrical components being sealed within the housing. Minks discloses the electrical components (shown in Fig. 5) being sealed within the igniter housing (see Claim 1). As to a discharge circuit being at least partially contained within the housing common with the charge circuit, Minks discloses all the electrical components of the exciter system

being housed within the same housing (see Fig. 4,5 and 7). Both references have the same problem solving area, namely providing means for ignition of the engine. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified solution of McNulty 720 by potting (sealing) the electrical parts of the ignition unit according to Minks, because as Minks states (col. 1, lines 49 – 55), it helps to protect the ignition circuit against adverse environmental influences, such as temperature and vibration.

Additionally, McNutty 720 does not disclose a connector. Straub discloses the cable connector (element 10 in Fig. 2). Both references have the same problem solving area, namely providing means for ignition of the aircraft engine. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by adding the cable connectors according to Straub at every opening of the housings (elements 26, 27 and 27a in Fig. 1), because use of the cable connector will make a connection easily removable if maintenance, test or repair of the ignition system is necessary.

Regarding Claim 22, McNulty 720 discloses one or more protective devices shielding said charging circuit together with other electrical circuitry (col. 3, line 70 – col. 4, line 10).

Regarding Claim 23, in the McNulty 720 system modified according to Straub, each opening in the housing having extending wires is provided with connector. Therefore, the terminal end of the igniter is provided with the connector, which always

includes a socket. A motivation for modification of the primary reference is the same as above (see Claim 14 rejection).

Regarding Claims 24 and 42, McNulty 720 discloses the housing as being generally cylindrical (see Fig. 2 and 8).

Regarding Claims 25 and 43, McNulty 720 discloses the first opening located on a circumferential surface of the cylindrical housing (openings for cables 24, 25, 85 in Fig. 8) and the second opening on the end surface of the housing (elements 141, 142 and 144 in Fig. 8).

Regarding Claim 26, McNulty 720 wherein the housing (elements 27, 27a in Fig. 1) contains a number of electrical components (see Fig. 1) that are a part of the discharge circuit and wherein all of the electrical components are passive devices.

Regarding Claim 34, McNulty 720 discloses the second housing (element 21 and 21a in Fig. 8) including a metal can having a metal lid (the upper part of the can in Fig.8) covering an open end of the can (col. 3, line 70 – col. 4,line 10).

Claims 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Straub, Minks, Standard Handbook for Electrical Engineers and the Court Decision *In re Boesch*. As was stated above, McNulty 720, Straub and Minks disclose all the elements of Claim 18. However, regarding Claims 19 and 20, they do not disclose the current supplied by the charging unit being less or equal to 100 milliamps. The Standard Handbook for Electrical Engineers discloses that the cost of power transmission is directly proportional to the carried current (formula 13 – 1 on

page 14 - 3). Therefore, as well known in the art of Electrical Engineering to reduce the cost of power transmission, the voltage is stepped up and the current eventually is reduced. This is true for the power transmission lines and for the cables as well. As to particular value of transmitted current, from formula 13 – 1, it is clear that the current value affects the cost of means of transmission and therefore, the current value is the result effective variable. The Court Decision states that discovering an optimum value of the result effective variable involves only routine skill in the art. On one side, it is desirable to reduce the current value as much as possible, since it reduces the cost of cabling. On other side, stepping up the voltage beyond some level may be costly as well. Therefore, the designer should select an optimum value of the current (voltage). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNulty 720 solution by stepping up the voltage and reducing the current to be transmitted by the charging circuit, since it has been held that discovering an optimum value of the result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over McNulty 720 in view of Straub, Minks and Mathisen (US 2,566,235). As was stated above, McNulty 720, Straub and Minks disclose all the elements of Claim 18. However, regarding Claim 21, they do not disclose the charging circuit being located within the aircraft fuselage and the low-energy cable extending from the aircraft fuselage into the aircraft wings. McNaulty720 teaches the ignition system as being split into two separate

units, charger (element 26 in Fig. 1) and discharger (elements 27, 27A in Fig. 1). It further teaches the discharger being positioned as close as possible to the engine (col. 3, lines 64 – 70). Therefore, for the aircraft having the engines in the wings, the discharger is positioned in the wings. However, it does not disclose positioning the charger positioned in the fuselage. Mathisen discloses the ignition system including the manual control switch (element 195 in Fig.2) located in the pilot cabin (in fuselage) and the engines located in the wings (col. 3, lines 59 – 67). Therefore, it is inevitable to have cables extending from the fuselage to the wings to control the ignition. The McNaulty720 charger includes the cam but modern charger circuits are built with electronics containing active parts. Both references have the same problem solving area, namely providing means of ignition for aircrafts. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McNaulty720 solution by placing the charger in the fuselage rather than in the wings, because (I) it would provide the charger parts much better environment (better temperature range, lesser vibrations, moderate humidity), which in turn would substantially improve the equipment reliability, and (II) it would make easier control (shutting off) ignition in a case of a fire emergency.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose current telephone number is (571) 272 - 2052. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach

examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272 – 2800, Ext. 36. The fax phone number for organization where this application or proceedings is assigned is (703) 872-9306 for all communications.

Z.K.
03/28/2005

BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER